



Executive Summary
**Amphibian Monitoring at
Apostle Islands National Lakeshore**
Winter 2008



Background – Amphibian populations were chosen as a Vital Sign for several reasons: they provide a biological link between land and water, they often occur at high densities and therefore occupy an important position in food webs, and they are sensitive to a wide variety of natural and human-related stressors. It is because of their vulnerability to stressors that many populations are known to be in peril. In 2006, the Great Lakes Inventory and Monitoring Network (GLKN, or Network) performed an initial survey for amphibians within Apostle Islands National Lakeshore.

Methods – The goal of the initial survey was to aid in the design of a long-term amphibian monitoring protocol that will allow for detection of any changes in amphibian populations over time. With this goal in mind, the initial survey had three primary objectives: 1) to gather information for park inventories, 2) to determine both the distribution of different species within the park and what affects the distribution of different species, and 3) to test the efficiency and effectiveness of various survey and research methods.

Monitoring was conducted from April through July 2006. Daytime sampling was performed at both island and mainland sites, and it involved call surveys as well as dip-net and visual searches. Call surveys consist of observers recording the amphibian species heard calling for mates at each site. Environmental variables were also recorded at each site. Because many species call most frequently after dark (when the islands are difficult to reach), we experimented with the use of automated recording devices to monitor calling amphibians.

Results – Ten daytime survey sites were established, eight on the islands and two on the mainland. Automated recording devices were placed at two island sites and one mainland site.

Nighttime Call Surveys – We detected four amphibian species with automated recording devices: the spring peeper (*Pseudacris crucifer*), gray treefrog (*Hyla versicolor*), American toad (*Anaxyrus americanus*), and wood frog (*Lithobates sylvatica*). We had numerous problems with automated devices, including equipment failure and interference by animals. However, we would not have detected gray treefrogs on Stockton Island or gray treefrogs and American toads on Basswood Island without remote recordings.

Daytime Surveys – We detected a total of ten amphibian species during daytime surveys. In addition to those detected during automated surveys (excepting the gray treefrog), we found the central newt (*Notophthalmus viridescens*), four-toed salamander (*Hemidactylium scutatum*), blue-spotted salamander (*Ambystoma laterale*), spotted salamander (*Ambystoma maculatum*), northern leopard frog (*Lithobates pipiens*), mink

frog (*Rana septentrionalis*) and green frog (*Rana clamitans*). It did not appear that any one daytime survey method was superior to the others.

Future work should emphasize the use of daytime surveys over automated surveys. Automated surveys allowed us to survey multiple islands simultaneously over an extended time during the peak amphibian calling period. No other method allows this. However, our problems with equipment, combined with that fact that daytime surveys allowed us to detect more species than automated surveys, lead us to conclude that daytime surveys are the most efficient approach given current technology.

Our pilot work provided good baseline information on amphibian occurrence, distribution, and abundance within the park. However, more data are needed before any firm conclusions can be drawn. Future analyses may provide insight into the environmental factors that affect amphibian populations at Apostle Islands.

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